

## ABSTRACT OF THE DISCLOSURE

5 The performance of forward error correction decoders for digital communication systems can be improved if soft information relating the reliability of the value representing the demodulated signal is provided to the decoder with a value for the signal. On the other hand, soft information increases the quantity of information that must be processed, increasing the cost and complexity of the decoder.

10 A first hybrid demodulation method produces a demodulated signal having bit values produced by both hard and soft decisions. Whether a bit is produced by a hard or a soft decision is determined by the relative position of the acquired signal and the vectors of the signal constellation for the multilevel modulated signal. Soft information for a bit relates the distance between a component of the  
15 acquired signal and a center of gravity of a signal constellation neighborhood defined by a set of signal vectors proximate to the acquired signal.

A second hybrid demodulation method produces a demodulated signal having a predetermined mixture of bits produced by hard and soft decisions. Log likelihood ratios (LLRs) measuring the reliability of the estimate of the value of  
20 each bit are compared so that soft decisions are applied to the least reliable bits. Limiting the LLRs results in a predetermined number of bits produced by soft decisions with the remainder produced by hard decisions.